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L2: Entry 1 of 1 File: USPT Oct 5, 1999

US-PAT-NO: 5962297
DOCUMENT-IDENTIFIER: US 5962297 A

TITLE: Polypeptides having .beta.-fructofuranosidase activity

DATE-ISSUED: October 5, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tsusaki; Keiji	Okayama			JP
Kubota; Michio	Okayama			JP
Chaen; Hiroto	Okayama			JP

US-CL-CURRENT: 435/200; 435/193, 536/23.1, 536/23.4

CLAIMS:

We claim:

1. An isolated polypeptide having .beta.-fructofuranosidase activity, which is obtainable by the expression of a Bacillus gene, contains the amino acid sequences of SEQ ID NOs: 1 and 2 and has the following physicochemical properties:

(1) Molecular weight

About 44,000-54,000 daltons on sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE);

(2) Optimum pH

About 5.5-6.0 when incubated at 40.degree. C. for ten minutes;

(3) Optimum temperature

About 45.degree. C. and about 50.degree. C. in the absence of and in the presence of calcium ion, respectively, when incubated at pH 6.0 for ten minutes;

(4) pH stablity

Stable at pHs of about 5.0-8.0 when incubated at 4.degree. C. for 24 hours; and

(5)Thermal stability

Stable up to a temperature of about 45.degree. C. when incubated at pH 6.0 for one hour.

2. The polypeptide of claim 1, which has an activity of catalyzing the

fructofuranosyl transfer between a fructofuranosyl donor and a fructofuranosyl acceptor.

3. The polypeptide of claim 1, which is obtainable by using a microorganism as a host and by expressing in said host a gene derived from a microorganism of the genus Bacillus.

4. A polypeptide comprising the sequence of SEQ ID NO:3.

5. An isolated polypeptide comprising the amino acid sequences of SEQ ID NO: 1 and SEQ ID NO: 2 and having a signal peptide region, for protein secretion, encoded by nucleotides 361 to 456 of SEQ ID NO: 5.

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L1: Entry 1 of 1 File: USPT May 7, 2002

US-PAT-NO: 6383769
DOCUMENT-IDENTIFIER: US 6383769 B1

TITLE: Polypeptides having .beta.-fructofuranosidase activity

DATE-ISSUED: May 7, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tsusaki; Keiji	Okayama			JP
Kubota; Michio	Okayama			JP
Chaen; Hiroto	Okayama			JP

US-CL-CURRENT: 435/15; 435/200

CLAIMS:

What is claimed is:

1. A method for fructofuranosyl transfer comprising reacting a fructofuranosyl donor with a fructofuranosyl acceptor in the presence of a polypeptide to transfer a fructofuranosyl residue from said fructofuranosyl donor to said fructofuranosyl acceptor, said polypeptide having .beta.-fructofuranosidase activity, said polypeptide being obtainable by using a microorganism as a host and by expressing in said host a gene derived from a microorganism of the genus Bacillus, containing the amino acid sequences of SEQ ID NOs:1 and 2 as partial amino acid sequences, and having the following physicochemical properties:

(1) Molecular weight about 44,000 to 54,000 daltons on sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE);

(2) Optimum pH about 5.5-6.0 when incubated at 10.degree. C. for 10 min;

(3) Optimum temperature about 45.degree. C. and about 50.degree. C. in the absence of and in the presence of calcium ion, respectively, when incubated at pH 6.0 for 10 min;

(4) pH stability stable at a pH of about 5.0-8.0 when incubated at 4.degree. C. for 24 hours; and

(5) thermal stability stable up to a temperature of about 45.degree. C. when incubated at pH 6.0 for an hour.

2. The method of claim 1, wherein said fructofuranosyl donor is a member selected from the group consisting of sucrose, raffinose, and erlose.

3. The method of claim 1, wherein said fructofuranosyl acceptor is a member selected from the group consisting of alcohols, sugar alcohols, and saccharides free of .beta.-fructofuranosidic linkage within the molecules.

4. The method of claim 1, wherein a reaction product is a member selected from the group consisting of xylosylfructoside, erlose, isomaltosylfructoside, lactosucrose, and fructosyltrehalose.

5. The method of claim 1, wherein 0.1-10 parts by weight of a fructofuranosyl acceptor is reacted with one part by weight of a fructofuranosyl donor at a pH of 3.5-8.0 and at a temperature of no more than 60.degree. C.